

CORRECTED VERSION

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
17 June 2004 (17.06.2004)

PCT

(10) International Publication Number
WO 2004/051239 A1

(51) International Patent Classification⁷: G01N 19/02

(21) International Application Number:
PCT/NL2003/000639

(22) International Filing Date:
16 September 2003 (16.09.2003)

(25) Filing Language: Dutch

(26) Publication Language: English

(30) Priority Data:
1021957 20 November 2002 (20.11.2002) NL

(71) Applicant (for all designated States except US): TEN
CATE THIOLON B.V. [NL/NL]; G. Van der Muelenweg
2, NL-7443 RE Nijverdal (NL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): OLDE WEGHUIS,

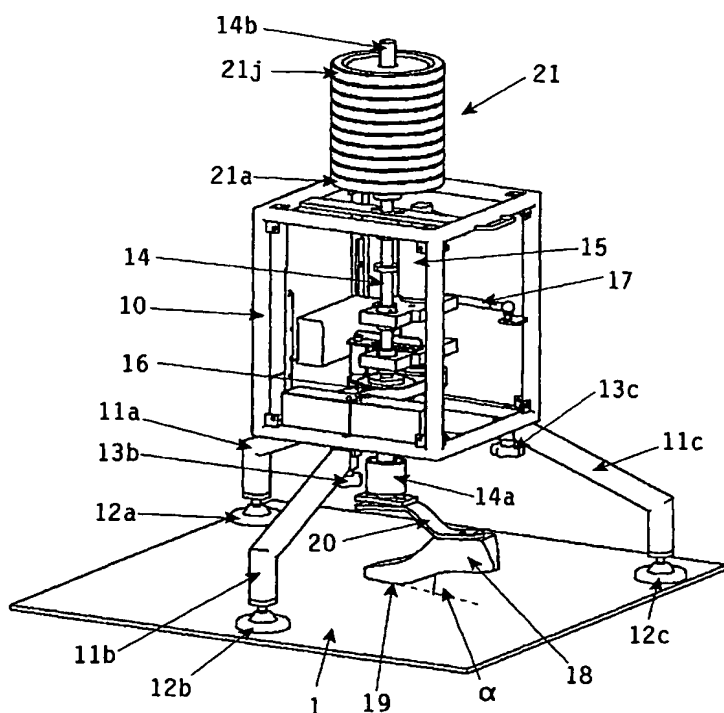
Marinus, Hendrikus [NL/NL]; Enschedesestraat 119,
NL-7574 AB Oldenzaal (NL). BIERMA, Gerben,
Christiaan [NL/NL]; Diekmanstraat 22, NL-7541 WS
Enschede (NL). HAZENBERG, Hendrik [NL/NL];
Haaksbergerstraat 174-606, NL-7413 EB Enschede (NL).
WITBREUK, Ingo, Wynand [NL/NL]; Duivekervel 21,
NL-7577 CK Oldenzaal (NL).

(74) Agents: VALKONET, Rutger, Jr, et al.; Algemeen Oc-
trooi-en Merkenbureau, P.O. Box 645, NL-5600 AP Eind-
hoven (NL).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD,
SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US,
UZ, VC, VN, YU, ZA, ZM, ZW.

[Continued on next page]

(54) Title: DEVICE FOR MEASURING THE STATIC AND/OR DYNAMIC FRICTION COEFFICIENT OF A SURFACE



(57) Abstract: The present invention relates to a device for measuring the static and/or dynamic friction coefficient of a surface, in particular a natural or artificial grass surface, which device comprises a housing placed on supports, which is to be positioned on the surface to be examined; a rotatable shaft, which is vertically disposed in said housing; a body connected to the end of said shaft that faces towards the surface, which body comprises a contact surface which can be brought into contact with the surface to be examined; as well as measuring means for measuring, during operation, the torque caused by the friction between the surface to be examined and the contact surface of the rotating body. The object of the present invention is to provide a device for measuring the static and/or dynamic friction coefficient of a surface which provides a more reliable and reproducible measuring result and which is furthermore user-friendly and easy to transport. According to the invention, the device is to that end characterized in that the contact surface of the body is in line with the axis of rotation of the rotatable shaft.



(84) **Designated States (regional):** ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(48) **Date of publication of this corrected version:**

10 September 2004

(15) **Information about Correction:**

see PCT Gazette No. 37/2004 of 10 September 2004, Section II

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

PCT/NL03/00639

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G01N19/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 712 418 A (AUGUSTIN HARALD) 15 December 1987 (1987-12-15)	1-3,5,6, 10-12 4,8,9,12
Y	column 1, line 6 -column 1, line 10 column 1, line 19 -column 1, line 52 column 1, line 66 -column 3, line 5 figure 1	
Y	WO 02 063279 A (SLOOTWEG GEURT BASTIAAN ;HAGE EDWARD (NL); OLDE WEGHUIS MARINUS HE) 15 August 2002 (2002-08-15) page 5, line 18 -page 6, line 24 figure 1	4,8,9
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the international search

9 December 2003

Date of mailing of the international search report

22/12/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5018 Patentlaan 2
NL - 2280 HV Rijswijk
Tel (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Koch, A

INTERNATIONAL SEARCH REPORT

PCT/NL03/00639

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	FR 2 751 748 A (LABOSPORT SOC) 30 January 1998 (1998-01-30) claim 8 page 4, line 19 -page 4, line 22 figures 1,2	12
P,X	US 2003/101793 A1 (EVANS PAUL R) 5 June 2003 (2003-06-05) page 4, column 2, paragraph 2 page 5, column 1, paragraphs 5,6 page 6, column 2, paragraph 1 -page 7, column 1, paragraph 2 page 7, column 2, paragraph 2 -page 8, column 1, paragraph 4 figures 1-7	1,3,5,12
A	GB 2 358 931 A (HAINES ROBERT CHRISTOPHER) 8 August 2001 (2001-08-08) abstract figures 1,2 page 1, line 4 -page 1, line 7 column 5, line 16 -column 11, line 43	1,2,6,7

INTERNATIONAL SEARCH REPORT

PCT/NL03/00639

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 4712418	A	15-12-1987	AT	384109 B	12-10-1987
			AT	56985 A	15-02-1987
			DE	3680126 D1	14-08-1991
			EP	0193521 A2	03-09-1986
WO 02063279	A	15-08-2002	NL	1017303 C2	08-08-2002
			EP	1358466 A1	05-11-2003
			WO	02063279 A1	15-08-2002
FR 2751748	A	30-01-1998	FR	2751748 A1	30-01-1998
US 2003101793	A1	05-06-2003	NONE		
GB 2358931	A	08-08-2001	US	2001047679 A1	06-12-2001